INFO-HAMS Digest Mon, 30 Oct 89 Volume 89 : Issue 824

Today's Topics:

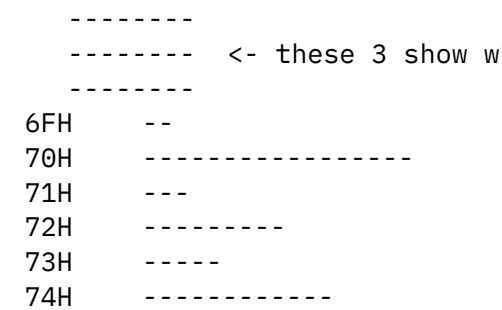
Date: 25 Oct 89 17:08:18 GMT
From: gem.mps.ohio-state.edu!ctrsol!IDA.ORG!roskos@tut.cis.ohio-state.edu (Eric Roskos)
Subject: Anomaly in A&A AM WEFAX Demodulator's ADC

The story continues ...

Last night I modified my previously unmodified A&A board to bring the /RD and /WR lines from the A/D converter to the set of pins on the edge of the demodulator board.

After doing this, and building the logic on the 8-bit port board to generate the /RD and /WR pulses when the port was accessed, I connected it all together, and found that the problem still exists! So it is not due to incomplete conversions being read from the board. It appears simply to be a problem with the demodulator board itself... possibly that the A/D converter that is used is too slow to convert a particular value of the demodulated signal before it changes to a new value, so the ADC gets partway through the conversion, finds the value has changed significantly, and gets 0's for the low-order bits as a result.

The distribution of values out of the A/D converter is interesting... the values with low-order bits of zero seem to "borrow" from neighboring values, and the height of the spikes is in proportion to the number of low-order bits that are zero. For example, a portion of the curve looks something like this:



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I did some testing with artificially-generated files to be sure it's not the histogram-producing software (it's not); and with random white noise (it gave a plausible distribution of the white noise, but with the "borrowing" anomaly as shown above).

At this point I don't have a good idea as to what might be causing it. It doesn't adversely affect the WEFAX pictures you get if you only use 4-bit data, and in fact the pictures are very good considering the price of the demodulator (both the AM and FM demodulators purchased together cost around $85), but it means you can't do enhancements of low-contrast areas of the image, or other types of image enhancements that rely on having data at a higher grey-scale resolution than you are able to display.

It looks like some artifact of how the ADC works... I have an ADC0820 which I am thinking of trying to see if it works better (the A/D converter on the A&A board is an ADC0804), since the ADC0820 has a built-in sample and hold, and can convert at around 20,000 samples/second.

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Eric Roskos (roskos@CS.IDA.ORG or Roskos@DOCKMASTER.NCSC.MIL)

Date: 24 Oct 89 13:54:58 GMT
From: gem.mps.ohio-state.edu!ctrsol!IDA.ORG!roskos@tut.cis.ohio-state.edu (Eric Roskos)
Subject: Anomaly in A&A AM WEFAX Demodulator's ADC

Recently I have added an 8-bit port to my PC for use with the A&A AM WEFAX demodulator kit (the original, unmodified kit), and wrote some software to plot a histogram of the data coming out of the A/D converter on the demodulator board. What I've found is kind of surprising.

The output from the board has *very* sharp "spikes" at each of the values at which the low-order four bits of the output from the A/D converter are zero (i.e., hex 00, 10, 20, 30, 40, ... , e0, f0) with a very small amount of clustering of values around each of these spikes. But the frequency of these low-order-bit-zero values is usually 10-20 times that of the values nearby that don't have zeros in the low-order bits.

This seems very odd, since I was receiving AM WEFAX images from NOAA 9 when I collected the data I used to plot the histogram, and I don't think the NOAA satellites have data distributed in this way. The A&A demodulator's A/D converter is wired in an unusual way, though... the

/INTR output pin is wired to the /WR pin (the normal connection for the "free running" mode), but the /RD pin is also wired to 0V. Programs that access the demodulator just read the demodulator periodically, without any status information, and without any control of starting a new conversion cycle.

I'm wondering whether this A/D converter, wired in this way, fairly often gives intermediate output values, in which the high-order bits have been determined but the low-order bits haven't been determined yet, and whether this causes the distribution I found? I looked up the A/D converter in my National Semiconductor databook (the equipment's at home, but I believe it is an ADC0804), and I can't tell from the diagram whether the latch that's between the shift register and the output latch only passes completed data through, or whether intermediate data goes through to the output latch (which I think is always in the "pass" rather than the "latch" state due to /RD being grounded). In any case, it looks like the board as supplied from A&A doesn't properly output the low-order bits of data, something that doesn't show up if you just connect it to the 4-bit game port the way the instructions recommend. I found in looking at the data that the image produced with the low-order bits included is very noisy, something that I think is due to this problem more than to noise from the received signal.

Does anyone have any insights or experience regarding this? Meanwhile I'm going to try modifying the board to let me start conversions immediately after I read the previous value, the way the ADC is designed to operate, in the hope this will fix the problem...

(If you have any suggestions, please mail to me and I'll summarize.)
--E.R.

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Eric Roskos (roskos@CS.IDA.ORG or Roskos@DOCKMASTER.NCSC.MIL)

Date: Mon, 30 Oct 89 7:40:47 CST
From: Will Martin <wmartin@STL-06SIMA.ARMY.MIL>
Subject: Correction re Antique Electronics Supply

My apologies for posting false information. I had mailed a note to the person who asked about crystal radio kits pointing him to Antique Electronic Supply as a source. Ironically, the next day I received a catalog from them in the mail. The address and phone # I had posted were correct, but my recollection that they sold various crystal radio kits was wrong. Their catalog lists no such kits. They do have some tube-radio kits, though. I dug out back issues of their catalog, and the latest one that had a crystal radio kit (the old breadboard one, I believe the same one that used to be sold under the brand

"Philmore") was 1985. I'm sure I've seen some literature from *somewhere* advertising crstal radio kits, but now have no idea where that might be.

Luckily, I suppose, my mailed note to the inquirer came back as "undeliverable" so this message is to correct the info that I CC'd to the hams list.

Regards, Will

Date: 30 Oct 89 13:54:24 GMT
From: gem.mps.ohio-state.edu!ctrsol!IDA.ORG!roskos@tut.cis.ohio-state.edu (Eric Roskos)
Subject: Deal on Sangean ATS-803A

kjl@atexnet.UUCP (Ken Lebowitz) writes:

>The radio does
>come with the CSM logo affixed to it but if you can live with that it
>seems like a deal.

Hey... you are sounding like Glenn "all radio stations with a religious affiliation are bad" Hauser. The Christian Science Monitor's radio stations have the same news content as the newspaper, and the same structure: good, "unbiased" news reporting, with clearly delimited religious content (I don't remember if there is any religious content at *all* during the weekdays, though). On the weekends, on the other hand, they do broadcast Christian Science religious broadcasts instead.

It's a station worth listening to, if you haven't done so previously.

Disclaimer: I am not a Christian Scientist, and have to admit that I find
 Mary Baker Eddy's writing somewhat perplexing. But I still like the
 radio station's news programs.
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Eric Roskos (roskos@CS.IDA.ORG or Roskos@DOCKMASTER.NCSC.MIL)

Date: 25 Oct 89 17:39:39 GMT
From: gem.mps.ohio-state.edu!ctrsol!IDA.ORG!roskos@tut.cis.ohio-state.edu (Eric Roskos)
Subject: Mail ordering radio gear.

Without going into great detail, I'd rank the mail-order companies I've ordered from, in order from best to worst, as:

1) Grove Enterprises
2) Gilfer's
3) EEB
4) Universal Shortwave

#4 I very strongly *don't recommend*. #3 is OK but if something comes with a free extra (e.g., free power supply), be sure you explicitly request it or you will end up having to call them back to get them to ship it. In person they tend to be somewhat discourteous, with a "too busy" attitude. They're actually a very small company, located in part of a metal garage-like industrial office part-style building way back off the road not too far from where I live. But they do have a large selection, especially for such a small company, though they usually only have a small number of each item in stock (and are sometimes sold out). Gilfer's has some nice antennas and other equipment that it's hard to find elsewhere, but doesn't always have the best prices. They also call some of their radios by strange names :-). Grove is very courteous, reasonably priced, and all-around nice folks, but they have a very small selection. They are also the publishers of Monitoring Times. I've never bought anything from Grove that I wasn't fully satisfied with; the same is true for Gilfer's.

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Eric Roskos (roskos@CS.IDA.ORG or Roskos@DOCKMASTER.NCSC.MIL)

Date: 30 Oct 89 14:29:31 GMT
From: pikes!udenva!awinterb@boulder.colorado.edu (Mr. Poot)
Subject: Press Photo Fax Schedule?

Anyone have a schedule for faxes of press photos out there?
A short list would be worth posting, I'd think.

...!ncar!udenva!awinterb
or according to rumor
awinterb@du.edu

Date: 24 Oct 89 13:37:14 GMT
From: gem.mps.ohio-state.edu!ctrsol!IDA.ORG!roskos@tut.cis.ohio-state.edu (Eric Roskos)
Subject: Re^2: WEFAX

> I don't expect this package will stand up against the like of a PK-232,

> but hey, it's 1/3 the price and if you just want WX maps, it'll do.

Actually, it may be better than a PK232. A PK232 deletes all but 1 out of n lines (where n is something like 6, depending on the aspect ratio), with the result that most of the text on the weather maps is lost. With the PK232 you just get a general idea of what's on the map; a good bit of detail is lost.

Regarding recommendations for equipment, personally I use the A&A Wefax demodulators; if you just want black & white HF charts (not satellite pictures with grey scale), the FM demodulator is around $35. Elmer Schwittek in Florida sells a "MultiFax" program that is a compiled BASIC program which reads the output from this demodulator through the game port or printer port (the parallel printer port can be used for 1-bit data such as is produced by the FM demodulator; the AM demodulator produces 8-bit data, and has to use at least the game port (4 bits) to get reasonable grey scale images). He just came out with a new version of the program, and I don't remember the new price, but the old version was $35. This hardware also works much better than the FAA-surplus electrolytic-paper WEFAX recorder I bought for $600 a few years ago, because the grey scales are better and the image is sharper. I subsequently wrote my own software (not very portable), which isn't too hard to do, but the Schwittek software is a good start.

But, see my next posting, on a problem with the A&A AM board...
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Eric Roskos (roskos@CS.IDA.ORG or Roskos@DOCKMASTER.NCSC.MIL)

End of INFO-HAMS Digest V89 Issue #824
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